

ABSTRACT OF THE DISCLOSURE

A solenoidal magnetic field generated by a coil around the upper chamber A acts as a magnetic plasma attenuator. By judicious adjustment of the magnetic field strength, a dense plasma region forms inside the tube and adjacent to an antenna and is at least partially trapped by the field lines. These field lines intersect the wall of the upper chamber near or on the lid, and either on the upper chamber wall near its base, or on the lid or upper walls of the lower chamber. Significant numbers of radicals can be created in the upper chamber, which then diffuse into the lower chamber. The associated ion flux is reduced, however, because of losses where the field lines intersect the walls, thereby ensuring that the ratio of ion numbers to radical numbers reaching the wafer is reduced.